

THE NATURAL RESOURCE DAMAGE ASSESSMENT SETTLEMENT

FINAL RESTORATION PLAN WHITE RIVER MARION, HAMILTON, and MADISON COUNTY, INDIANA

December 2003

Department of the Interior
U.S. Fish and Wildlife Service

Indiana Department of Environmental Management

Indiana Department of Natural Resources

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Introduction

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Federal Water Pollution Control Act authorize States and certain federal agencies that have authority to manage or control natural resources, to act as “trustees” on behalf of the public, to restore, rehabilitate, replace, and/or acquire natural resources equivalent to those harmed by the release of hazardous substances. The United States Department of Interior (represented by the United States Fish and Wildlife Service) and the State of Indiana (represented by the Indiana Department of Natural Resources and the Indiana Department of Environmental Management) have worked together, in a cooperative process, to determine what is necessary to address natural resource injuries caused by past release of hazardous substances into the Upper West Fork of the White River. Natural resource damages received, either through negotiated or adjudicated settlements, must be used to restore, rehabilitate, replace, and/or acquire the equivalent of those natural resources that have been injured.

Purpose

The purpose of this restoration plan is to consider alternative actions which will restore, rehabilitate, replace, and/or acquire the equivalent of any natural resources and services injured by the release of hazardous substances into the Upper West Fork of the White River. However, the completion of this Restoration Plan does not constitute pre-approval of any specific projects.

Any selected alternatives must be consistent with statutory mandates and regulatory procedures that specify that recovered damages are used to undertake feasible, safe, and cost-effective projects that address injured natural resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and are consistent with applicable laws and policies.

CERCLA requires the federal government to promulgate regulations for developing natural resource damage claims. The Natural Resource Damage Assessment regulations outline restoration planning, providing that restoration plans should consider ten factors when evaluating and selecting among possible projects to restore or replace injured natural resources. The factors below are part of the needs that will be used to select an alternative and to subsequently select projects within an alternative.

1. Technical feasibility
2. The relationship of the costs of the alternative to the expected benefits
3. Cost-effectiveness
4. The results of actual or planned response actions
5. The potential for additional injury resulting from the proposed actions
6. The natural recovery period
7. Ability of the resources to recover with or without alternative actions
8. Potential effects of the action on human health and safety
9. Consistency with relevant federal, state, and tribal policies
10. Compliance with applicable federal, state, and tribal laws.

Background of Incident and Injury

The Guide Corporation is located at 2915 Pendleton Avenue in Anderson, Madison County, Indiana. The facility has manufactured automotive head-light and tail-light assemblies since 1929. General Motors Corporation owned and operated the plant until 1998, when the facility was then leased to the Guide Corporation.

In the early 1970s, a wastewater treatment plant was constructed at the facility to treat industrial wastewater generated during the manufacturing process. Part of the process included plating metal onto plastic parts giving them a chrome finish. Guide operated the wastewater treatment plant under a pretreatment permit issued in 1998 by the City of Anderson. That permit limited the amount of chemicals including copper, nickel, and chrome that could be legally discharged to the Anderson sewer system.

The Guide wastewater treatment plant treated batches of wastewater through the use of a hydroxide precipitation process in which it would add sodium hydroxide to cause the metals present in the wastewater to coagulate to form flocs which would then settle to the bottom of the tank. A metal polishing agent was then added to further precipitate out any residual metals still present. The resulting sludge from the tanks were then disposed of as hazardous waste.

The Guide Corp wastewater treatment plant consisted of 5 treatment tanks, 3 sludge holding tanks, a blend tank, and a clarifier. In the last 10 years, the Guide treatment plant typically treated 1 or 2 batches of wastewater per day. A batch usually was between 145,000 and 175,000 gallons. Since at least 1999, the treatment plant used HMP 2000 as the polishing agent. The active ingredient of HMP 2000 is sodium dimethyldithiocarbamate (SDDC). Under normal conditions, approximately 20–30 gallons of HMP were used to treat each batch of wastewater.

As part of the lease agreement with General Motors, the Guide Corp committed to end plating operations at the plant and to shut down the wastewater treatment plant by the end of December, 1999. To accomplish this, Guide began shutting down plating operations by the end of September of 1999. Plating tanks of the facility and tanks in the treatment plant were emptied and cleaned. As a result, the wastewater had extremely high concentration of metals and other industrial chemicals. Guide tried to remove the contaminants from the wastewater by adding large amounts of HMP 2000 as well as trying other more non-conventional water treatment methods. This failed and as a result, large amounts of HMP 2000, as well as other contaminants, were released to the Anderson wastewater treatment plant. The untreated wastewater quickly overwhelmed the Anderson WWTP, allowing ammonia and raw wastewater to reach the White River. It is estimated that approximately 10,000 gallons of HMP 2000 was illegally released to the river over a 10 day period.

When HMP 2000 is used in industrial applications and released to the environment, it degrades

into a more lethal chemical called tetramethylthiuram disulfide, also known as thiram. Thiram is registered as a general use pesticide by the US.

On December 16, 1999, after the raw wastewater began to reach the river, the Indiana Department of Natural Resources began to receive reports of dead and dying fish on the river. Over the next 2 months, the Indiana Department of Environmental Management picked up more than 118 tons of dead fish from the river.

The White River

The White River is part of the Mississippi River system and drains 11,350 square miles of central and southern Indiana. The river begins as a small creek in Randolph County and flows in a general southwest direction through or near Muncie, Anderson, Indianapolis, Martinsville, Worthington, and Washington before joining the Wabash River near East Mount Carmel in Gibson County. The White River, from its beginning to its confluence with the Wabash River, is on the Outstanding Rivers List for Indiana, as having outstanding ecological, recreational, or scenic importance. The river is used for a wide variety of uses including fishing, boating, nature study, hunting, industrial plant cooling, municipal water supplies, and wastewater treatment plant discharge.

For the purposes of this restoration plan, the target area of the river being addressed for restoration activities begins in Anderson and extends downriver to 16th Street in Indianapolis. This target area has been identified as the most significantly injured portion of the river as a result of hazardous materials released from the Guide facility in December of 1999. This target area is approximately 57 miles long and runs through a variety of landscapes and ecosystems.

In general, the average yearly precipitation of the restoration area is approximately 42 inches. The average winter temperature is 30 degrees F and the average summer temperature is 74 degrees F. Outside of Indianapolis, the dominant land use in the restoration area is agriculture. Forested areas tend to be mixed with agricultural land and are highly fragmented. Most of the remaining forested tracts are unsuitable for rowcropping and are commonly used for cattle grazing.

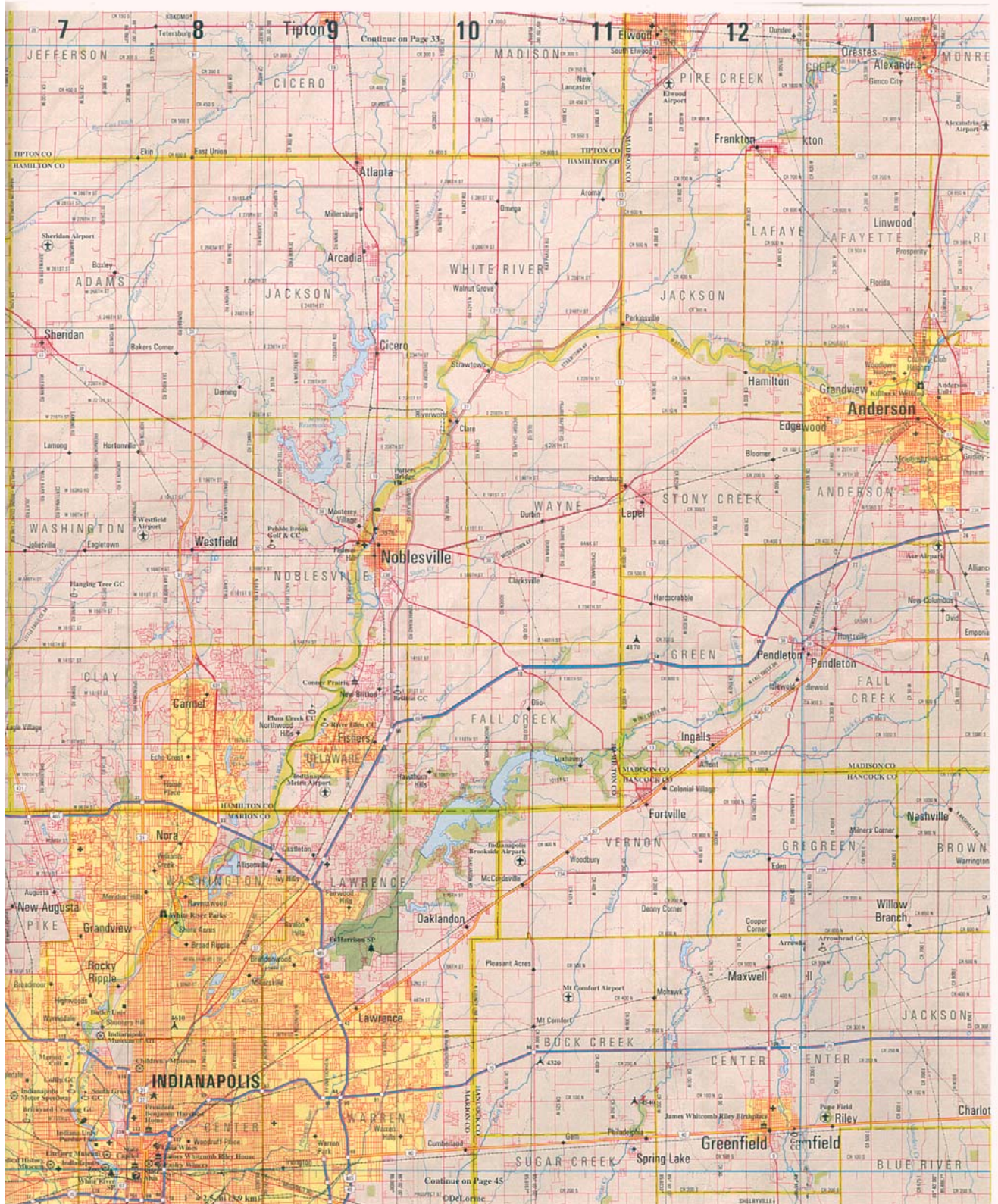
At the beginning of the target area in Anderson, the river can be characterized as a relatively wide and shallow river with a rock bottom. The water tends to be fairly clear except during times of high waters. In general, this section of the river is not conducive to motor-boat traffic, and most often is used by canoeists. Large boulders and rock shelves are seen under the surface and protruding from the water. The average flow rate at the Anderson 12th Street Bridge is 38 cubic feet per second. The lowest recorded flow was in August of 1940 at 9 cubic feet per second and the highest recorded flow was in March of 1913 at 28,000 cubic feet per second.

As the river flows west towards Perkinsville, it is surrounded by agricultural fields. This section of the river consists of several oxbows and is probably the most natural section of the target area. Normal water depth varies between deeper slow moving pools at 3 to 7 feet deep and faster shallow riffles which may be 2 to 12 inches deep. The river bottom in this stretch varies from a sticky clay/silt, small and large gravel, to exposed bedrock. Boat traffic is generally limited to canoes, although the more adventurous fishermen may be seen using a small motor-boat.

From Perkinsville to Noblesville, the river flows through areas of shallow gravel bottom riffles and deeper slower moving pools. The low head dam at Clare is also located in this section.

Boat traffic is now more common, although there are still shallow areas where motor-boats cannot pass under normal flow conditions. This section is also bordered by agricultural fields which often have a narrow strip of trees situated between the fields and the river. In some areas, the land is farmed up to the river bank. The average flow at the Noblesville Logan Street Bridge is 836 cubic feet per second. The minimum flow on record was in September of 1954 at 44 cubic feet per second and the maximum flow was recorded in April of 1964 at 26,800 cubic feet per second.

Flowing towards Indianapolis, the river is increasingly surrounded by residential, commercial and industrial development. Waste water treatment plant discharges become more common as well as various other culverts and drainage ditches. Severe erosion sites are also visible in this section near large river bends and construction sites. As result of previous strip mining in the floodplain, large pools are common between I465 and 16th Street adjacent to the river. There are also lowhead dams at Broad Ripple and at 16th Street. The average flow in Indianapolis at the Morris Street is 1,398 cubic feet per second. The lowest recorded reading was taken in September of 1941 at 8 cubic feet per second and the highest record was in March of 1913 at 70,000 cubic feet per second.



Injury to Trust Resources

Large amounts of untreated wastewater containing hazardous substances were released from the Guide Corp facility for approximately 10 days in December of 1999. It is difficult to determine the complete list of hazardous substances illegally released, but it has been confirmed that HMP 2000, sodium dimethyldithiocarbamate, tetramethylthiuram disulfide (thiram), and ammonia were present in toxic levels. Other contaminants likely released during the incident include chromium, copper, nickel, sulfuric acid, and sodium hypochlorite. The State of Indiana worked for months to determine the actual injuries to the river as a result of the release. The most obvious injury to the river was the large numbers of dead fish that were picked up by the Indiana Department of Environmental Management. By the spring of 2000, IDEM contractors had picked up and disposed of approximately 118 tons of dead fish. By using modeling programs designed to estimate fish kill numbers, the Indiana Department of Natural Resources estimated that approximately 180 tons of fish to have actually died during the incident. There were most likely additional long-term injuries to fish that actually survived the event, but suffered debilitating effects such as blindness and skin lesions.

Due to the nature of the river and of the hazardous substances released, remedial activities could not be implemented. Thiram, probably the most toxic substance concerned, has a specific gravity of approximately 1.3, making it heavier than water. Thiram would tend to accumulate towards the bottom of the river, especially in deeper slow-moving pools. Thiram is able to bind to the river sediments, but does not have the same toxic effect as being suspended in the water column itself. Once the source of the thiram was addressed, the natural action of the river would dilute the contaminant and carry it downstream. Once in the river, nothing could be done to remove the contaminant, besides waiting for the river to naturally purge itself.

Injury to trust resources from this release include all resources associated with the riverine communities. These resources include:

- Fish
- Fish habitat
- Fish eating birds
- Fish eating reptiles
- Fish eating mammals
- Lost fishing use of the river
- Lost recreational use of the river
- Surface water quality.

The Natural Resource Trustees of the State of Indiana and the United States Government undertook a civil natural resource damage action under CERCLA and the Clean Water Act to address injuries to riverine resources that resulted from release of hazardous substances into the river. The civil action was settled through Consent Decree Case No. IP-00-0702-C-D/F. The settlement provided \$6,000,000 to the Natural Resource Trustees to restore, rehabilitate, replace and/or acquire the equivalent of those natural resources that have been injured.

White River Citizens' Advisory Council

The Trustees established a Citizens' Advisory Council to consult with and advise the Trustees on the selection and implementation of restoration projects to be funded with monies from the White River

Restoration Funds. The Trustees, pursuant to authority vested in them under federal law, retain ultimate authority to select and implement restoration projects.

The WRCAC is composed of representatives from each of the 3 major cities through which the White River flows, representatives from the environmental community, citizen representatives, a representative from the education community, and a representative from industry.

Restoration Project Administration

The Natural Resource Trustees will oversee and implement this restoration plan and ensure that restoration projects meet natural resource damage assessment (NRDA) requirements. Categorical exclusion from National Environmental Protection Act (NEPA) procedures is provided for actions implemented by the FWS for natural resource damage assessment restoration plans that result in a negligible change in the use of affected areas (516 DM 6 Appendix 1). The Natural Resource Trustees will work to ensure that projects either meet the intent of the categorical exclusion or fulfill NEPA requirements.

For any restoration projects considered, the potential for project activities to affect cultural resources such as prehistoric and historic resources, Native American human remains, and cultural objects will be determined early in project planning. To this end, the procedures in 36 CFR 800 implementing Section 106 of the National Historic Preservation Act, requirements of the Native American Graves Protection and Repatriation Act, and policies and standards specified in the Fish and Wildlife Service Manual 614 FW 1-5 will be achieved.

Settlement funds will be administered by the Natural Resource Trustees according to the proposed budget and the U.S. Department of Interior Departmental Accounting Manual@ (National Capital Region General Services Administration, 1995) and Accounting and Uniform Compliance Guidelines Manual for State Agencies@ (State Board of Accounts, 2000).

Project Coordination

The Natural Resource Trustees collectively will be responsible for overall project coordination and support, and will work to ensure that projects meet the NRDA requirements and fulfill the goals of this restoration plan. The trustees will be responsible for identification of applicable projects, landowner contact, easement development, and any other necessary restoration procedures. Private or other public organizations may assist in the proposal of projects, sites, and/or the acquisition of and deed restrictions for the proposed site(s). Approval of restoration projects, sites, activities, and fund allocation will be through unanimous agreement by the Natural Resource Trustees.

Goal and Objectives of Restoration

The goal of this restoration plan is to address the resource injuries resulting from the releases of hazardous substances from the Guide Corp facility. Objective to accomplish this goal can be achieved for losses of injured natural resources through restoration, replacement or acquisition of the equivalent of injured natural resources.

Restoration Alternative Development and Evaluation

A reasonable range of restoration alternatives to address one or more specific injuries while making the environment and the public whole were considered, including the natural recovery/no action alternative, as well as the primary and compensatory restoration alternatives. For each alternative, consideration will be

given to costs, benefits, likelihood of success, and effects on public health and safety.

The following are three alternatives the trustees identified to meet the requirements of the NRDA laws, as well as fulfill the goal and objectives of this Restoration Plan.

1. No further action: This alternative would provide for no action to be taken to restore resources injured by the hazardous substance releases from the facility except through natural recovery. It would not provide compensatory losses to the public for the interim losses to natural resources from the time of the incident until recovery is achieved or for the uncertainty associated with the results of natural recovery.
2. Primary restoration of the impacted area: This alternative would provide for efforts to remove the hazardous substances and their by-products from the White River.
3. Restoration of resources impacted by the facility or that will serve as compensation for injured resources through acquisition, rehabilitation and protection of equivalent resources: This alternative would restore the injured resources and the services they provided to the environment and the public by increasing the occurrence of and/or enhancing or restoring habitats that will support these resources.

Summary of Environmental Consequences by Alternative

Alternative #1: The goal of this restoration plan is to address the resource injuries resulting from the releases of hazardous substances from the Guide Corp facility. This alternative does not allow for restoration, replacement, or acquisition of equivalent resources injured in this release. Without restoration, compensation for injury to natural resources would not occur.

Alternative #2: Due to the characteristics of the contaminants and the river, remedial activities were not feasible.

Alternative #3: Restoration of resources impacted by the facility or that will serve as compensation for injured resources through acquisition, rehabilitation and protection of equivalent resources is the **preferred alternative** of the Trustees. This alternative was selected because it best meets the goal of the restoration plan: to address the resource injuries resulting from the releases of hazardous substances from Guide Corp. This alternative will focus restoration monies on areas where maximum restoration, replacement or acquisition of the equivalent of injured resources can be achieved.

Restoration Process

Implementation of this restoration plan will involve cooperative efforts between private and public landowners; city, county, state and federal agencies; not-for-profit organizations, public volunteers, contractors and consultants. Restoration activities will cover a broad array of natural resources associated with the river. Specific project selection will be based on many factors including technical feasibility, cost to benefit ratio, total cost, and benefit to the river's resources, and cost effectiveness. Restoration projects may include, but are not limited to:

- Fish restocking - Fish restocking efforts will be conducted as needed to redevelop the fish community in the affected stretch of the river. According to a recently released DNR document titled "The Assessment of Fish Losses From the West Fort White River, Indiana Fish Kill of December 1999, approximately 4,266,171 fish were killed as a result of the release at Guide Corp. This number is based on actual fish collections before the kill, collections during the kill, collections after the kill and the fish that were picked up from the river by IDEM in the winter of 2000. Although some fish will migrate back into the area of impact, it would take several years for the fishery to naturally recover without assistance from restocking efforts. Fish species being restocked include channel catfish, flathead

catfish, largemouth bass, smallmouth bass, white crappie, bluegill, redear, sauger, rock bass, bigmouth buffalo, shorthead redhorse, and freshwater drum.

- Fish monitoring - Monitoring programs will be used to track the restocking results and to assess the river's progress in recovering after the fish kill. Detailed studies of the fish population continue to be conducted that will provide IDNR with a continuous picture of how the fishery recovery is proceeding. Angler surveys are also being used to document fishing pressure and catch rates for various regions of the river.
- Protection, restoration, and/or acquisition of ecologic important natural areas – Acquisition and necessary restoration of bottomland, riparian and wetland habitats will be accomplished using accepted, standard methods. Restoration activities may include, but are not limited to: purchase by acquiring fee title and/or permanent conservation easement and if necessary the reestablishment of hydrology in drained wetlands; removing exotic species; revegetating wetland or riparian habitats with native trees, shrubs and/or grasses; and/or stabilizing eroding stream banks with vegetation or other materials. The trustees will only acquire property from willing landowners who own lands that provide ecological services equivalent to those injured by the Guide facility. If lands are acquired, they will be deeded to the State, other public land management entities, or private land management entities with appropriate conservation easements or deed restrictions.
- Protection and restoration of buffer strips - Buffer strips are areas of land adjacent to the river, usually vegetated with tree, shrubs and/or grasses, that serve to protect the river from nearby land use. Buffer strips filter runoff from farm fields, parking lots, etc., absorb excess nutrients, stabilize river banks, improve fisheries, enhance wildlife habitat, and improve flood storage capacity. The Trustees will work with willing landowners along the river to acquire conservation easements and if necessary conduct restoration activities on the buffer strips. In general, the buffer strips would be a minimum of 65 feet wide with no maximum width set. A conservation easement is basically an agreement between the landowner and the Trustees where the landowners is paid for certain rights of the property. These rights are usually that the landowner will leave the buffer strip as is after the restoration of the land is complete. The property is still owned by the landowner and can be used for passive recreational use such as fishing, hunting, birdwatching, etc. The purchase price of the conservation easement is determined using accepted, standard appraisal methods and can vary greatly between different properties.
- Construct and/or upgrade public access points to the river - At the present time, the only public boat launching facility between Indianapolis and Anderson is at Forest Park in Noblesville. There are other private access points on the river but are generally not available to the general public. The Trustees see a need to install new public access points at several locations on the river as well as upgrade or renovate certain facilities already present. At certain locations, the Trustees will work with willing landowners to purchase property and install both trailered boat launches as well as small boat and canoe launching facilities. These facilities may be owned and operated by the State or local units of government.
- Promote public safety on the river - With the increased recreational use of the river, it is important that safety be an important component for river users. The Trustees envision activities such as installing dam warning signs and buoys, marking highway bridges, improving canoe portages around dams, and removing river obstacles and hazards to be worthy activities for the use of restoration funds. These projects will vary greatly and each one will present unique issues and challenges.
- Conduct river cleanup events, when and where needed - For decades, if not longer, the river has been used for illegal dumping. There are numerous small farm-type debris piles consisting of discarded equipment, fencing, and machinery as well as larger more disturbing fly dump areas where people have pulled off the side of the road and thrown their unwanted items down the river bank. Items such as tires, washers and dryers, bath tubs, automobile engines, mattresses, carpeting, etc. These dumps are

not only upsetting to river users, but can pose physical hazards to river traffic and degrade the overall health of the river. Over time, these dumped items are scattered all over the river during times of high water. After almost every high water event, new trash can be found on the river's edge where it was hung up by a tree, rock, or gravel bar.

Monitoring Restoration Effectiveness

Monitoring the implementation of this restoration plan will be done by the Natural Resource Trustees or their designated representatives. Location of property for acquisition or protection through easement or deed restriction and/or sites where restoration can be accomplished will be the first step in implementation. On sites where restoration activities will be completed, design of site plans, site preparation, establishment of hydrology (if required) and vegetation, and maintenance requirements will be considered. A monitoring plan developed for each restoration site may include: data to be collected, sample sizes, sampling schedule and duration, analysis techniques, and performance criteria. The Natural Resource Trustees or their designated representatives will determine if corrective action is indicated after review of monitoring results.

Projects Selected to Implement the Preferred Alternative

Fish Restocking

The Indiana Department of Natural Resources – Division of Fish and Wildlife conducted an angler survey, fisheries survey and data analysis, and restocked fish that were lost due to the fish kill.

In summary, the following are projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Fish restocking and associated administrative costs for IDNR
- Fish restocking by White River Rescue 2000
- Estimated budget: \$268,177

Conservation Easement/Property Acquisition Appraisals

The Indiana Department of Natural Resources – Division of Land Acquisition will be responsible for contracting out real estate appraisals and reviewing those appraisals for accuracy and completeness before an offer will be made for easement or complete purchase.

In summary, the following are projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Contracting of appraisals for property purchases
- Estimated Budget: \$80,000

Earth Day Indiana Advertisement

The Indiana Department of Environmental Management will place an add in the Earth Day Indiana Festival Program Guide describing the White River Citizens Advisory Council to those participating in Earth Day Indiana Events.

In summary, the following are projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Advertisement in Earth Day Indiana Program
- Estimated Budget: \$1,750

Fish Community Analysis and Habitat Evaluation

The major tributaries are a source of fish that will migrate into the River, but more information on the fish communities and habitat quality is needed. The primary purpose of this project is to provide baseline information on the fish communities and habitat quality is needed. The primary purpose of this project is to provide baseline information on tributary fish communities and their associated habitats to enable assessment of future fish community and habitat changes. The objectives are as follows:

- a) Assess the fish populations in each major tributary at multiple sites from their junction with the White River to their headwaters.
- b) Assess the habitat quality (QHEI) of each major tributary at multiple sites from the White river to their headwaters.
- c) Characterize the fish communities in relationship to the habitats for each tributary.

In summary, the following are projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Fish community and habitat assessment of the White River and it's major tributaries.
- Estimated Budget: \$90,300

Burr Oak Bend

Burr Oak Bend is a 52-acre parcel of floodplain property in an oxbow of the White River in Hamilton County and was historically an agricultural field. The property has an existing wooded area present along th banks of the river. This site adjoins a complex channel of the White River providing varied habitats for aquatic life including riffles, pools, and chutes. One of the few mussel beds known from this stretch of the river occurs here. This project entails property acquisition, restoration and management. The Central Indiana Land Trust Incorporated (CILT) has purchased the land and has planted approximately 40 acres of the site with trees with the remaining acreage to be planted a variety of native prairie grasses and forbs. Within the existing forest corridor, exotic woody species will be controlled and removed.

Exotic species are species that have been introduced into alien environments (such as a continent where the species did not previously exist) either intentionally or accidentally (Begon et al. 1990). Disturbed urban forests, such as Juan Solomon Park, are more vulnerable to exotic species introduction than larger intact rural forests, as the probability of introduction is greater in systems that experience more disturbance. Predators that may help control the exotics in their native environments are generally not present in the new environments. Thus, once the exotic species are introduced, they tend to reproduce rapidly, form dense stands, and out-compete native plant species. Invasion by exotic plant species injures natural areas by altering ecosystem processes, displacing native species, hybridizing with native species and changing their genetic makeup, and supporting other non-native plants, animals, and pathogens (Randall 1996). The availability of water and nutrients, the rate of soil erosion, and the number of native plants which support native animal species may be altered by exotic species. In forested areas, the level of sunlight and soil temperature are important variables that can be affected by the exotic plants as well.

In summary, the following are projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Property acquisition and permanent conservation easement placed on the property.
- Tree and prairie plantings at the site.
- Control of exotic species.

- Estimated Budget:

\$233,250

White Owl Conservation Area Restoration

White Owl Conservation Area (WOCA) is a 6.51 acre parcel of land in Marion County, Indiana just south of 86th Street on the West side of the river. This parcel was originally wetland habitat that included a pond and riparian forest. When Fashion Mall Commons shopping center was built at Union Chapel Road and 86th Street, the developers donated this parcel for purposes of conservation and mitigation after a unified neighborhood effort. WOCA was established and the board of directors elected in 1996 and has since attained 501© 3 status with the intent of restoring the parcel to provide wildlife habitat and to create a buffer zone between the river and the shopping center.

The restoration of this parcel involves invasive species removal and management (i.e. bush and japanese honeysuckle, garlic mustard, and reed canary grass), native tree and shrub plantings along the riparian corridor, native grass and sedge woodland seed installation in the understory of the riparian corridor, native warm season grass & wildflower buffer planting between the riparian corridor and the pond, installation of shoreline vegetation around the pond, and streambank stabilization at a problem area along the river itself.

In summary, the following are projects identified by the Natrual Resource Trustees as meeting the goal and objectives of this restoration plan:

- Exotic species control.
- Riparian buffer plantings.
- Shoreline vegetation for pond.
- Streambank stabilization.
- Estimated Budget:

\$58,000

Marian College EcoLab Restoration

The Marian College EcoLab is a rarity in that it is located near downtown Indianapolis with groundwater sinks and seeps dotting the property. It contains approximately 30 acres of functioning wetland marsh, fen and swamp habitat. Over 260 species of plants including 26 sedges, 120+ bird species, and mammals such as beaver, muskrat, mink, and red fox use this island of wetland habitat within the city. The EcoLab contains 1st and 2nd generation growth from the plantings from the James A. Allison estate gardens that were designed and developed by landscape architect and conservationist.

This project will improve habitat and water quality along Crooked Creek in the White River watershed ½ mile upstream from White River by fighting exotic invasive plant species in the Marian College EcoLab directly through removal and indirectly through re-vegetation with native plants. In addition, revegetation in areas impacted by trail installation and areas being “reclaimed” from turf grass as well monitoring the effectiveness of these restoration efforts will be completed. The EcoLab habitat restoration project will directly affect habitat and also has the potential to affect attitudes through the outreach activities of the EcoLab about the importance of wetlands and high quality habitat to our quality of life.

In summary, to continue to improve habitat in the EcoLab and the watershed, several habitat improvements will be made which have been identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Exotic species removal & maintenance.
- Native species replanting in exotic damaged areas.
- Restoration of areas impacted by trail installation.
- “Reclamation” of turf grasses to native plants.
- Restoration efficacy monitoring.

- Estimated Budget: \$238,216

Price Property - Acquisition and Restoration

This project involves the purchase and restoration of a tract of White River bottom land in Madison County. The property is approximately 37.5 acres and adjoins the White River. The site has been farmed for many years. Based upon the surrounding areas with similar topography and soils, it has been determined that prior to conversion to farmland, the property was a mixed hardwood forest.

A small forested riparian corridor exists along the river and includes mature canopy trees including green ash, sycamore, cottonwood, and maples. Within the eastern portion of the forested area is a small wetland, or fen, with a variety of wetland species.

This project involves the conversion of the farmland to native plant communities, which will perpetuate the natural function of the floodplain. In addition to the restoration, there will also be a canoe launch installed for public access to the river.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Property acquisition, permanent conservation easement & establishment of riparian buffers
- Invasive plant removal
- Plantings of trees, wetland and prairie grasses and forbs
- Planting of a screen buffer to adjacent properties along the fire lane
- Installation of canoe launch
- Estimated Budget: \$179,372

Craig Property Acquisition

This project involves the purchase of 37 acres of floodplain in Hamilton County that is completely forested. The Department of Natural Resources holds the title to the property.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Property acquisition & protection of riparian buffers
- Estimated Budget: \$113,300

Indian Creek Properties

This project involves the purchase of Conservation Easements (CE) on two adjoining land parcels (The Green and Arellano Properties) that adjoin the White River in Madison County. The Green property covered under the CE is approximately 25 acres. The Arellano property covered under the CE is 103 acres. The Arellano property has a portion of Indian Creek, a tributary to the White River, that runs through the property.

The Arellano property contains some excellent examples of wooded river corridor and contains a high plant diversity. There are two areas that are located on high flood terraces that were in row crop agriculture until recently. The eastern field, a 5-acre field, was planted with bare-root bottomland hardwoods in the Spring of 2001. Seedling survival has been acceptable, however, no seed mix was planted between the rows, resulting in considerable weed pressure. The western field, approximately 15 acres, has been fallow since 2000 no plantings attempted. The restoration plan for the property includes the reforestation along with understory seed mixes on these two areas as well as invasive plant removal in the existing wooded

corridor.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Purchase of permanent conservation easement
- Protection of riparian buffer
- Invasive species removal reforestation of fallow fields
- Estimated Budget: \$325,681

USGS Suvery of Bank Erosion and Large Woody Debris

This project involved mapping bank erosion and accumulations of large woody debris along the 57 mile reach of the White River from Anderson to Indianapolis. Along the entire study reach, bank erosion was mapped in terms of extent of severity. This survey will be used as an aid for the Trustees to prioritize any streambank stabilization projects in the area of injury.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Survey of streambanks to aid in prioritization of streambank stabilization at project sites.
- Estimated Budget: \$85,500

Watershed GIS Feasibility Study

The Upper White River Watershed Alliance (UWRWA) is undertaking a feasibility study to developing a Web Based Geographic Information System to manage, analyze, and share information within the watershed. The feasibility study will evaluate the existing spatial data and systems that will impact implementation of the GIS, clearly document its GIS project objectives, and prepare detailed specifications to advise the UWRWA on how to best move from the beginning point to the ending point.

This would build upon the Indiana Water Quality Atlas currently being developed by the Polis Center at IUPUI with a Clean Water Act Section 319 Nonpoint Source water quality grant.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Feasibility study of the web-based GIS for the Upper White River Watershed.
- Estimated Budget: \$15,000

Clare Dam Canoe Portage

The Clare Dam Canoe Portage is owned by Cinergy-PSI and is in need of improvements for public safety and accessibility in Hamilton County. There are three components to this project: improve the upstream take-out point, improve the portage trail, and improve signage upstream of the dam. The canoe portage is in disrepair and requires upgrading to a gravel take-out point and a concrete portage trail around the dam. Currently, there is minimal signage that needs to be updated and increased both “dam warning” and “portage” signs.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Installing “dam warning” and “portage” signage.
- Upgrading portage trail and take-out point.
- Estimated Budget: \$38,000

Joyce Avenue Restoration

The Joyce Avenue Dump is located in White River Township in Hamilton County, Indiana. A recent clean-up at the site along the west bank of the the White River has left an area of approximately a tenth of an acre (60' x 75') void of vegetation and topsoil.

Restoration at the site will consist of bringing in topsoil to aid in grass and tree establishment, grading and leveling topsoil, planting 30 3-gallon containerized tree stock, seed, fertilizer, and mulch hillside, installing silt fence at the toe of slope, planting bare root trees and shrubs along slope and at base of slope.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Reseeding and planting of trees, shrubs, and grasses.
- Enhancing substrate with addition of topsoil.
- Estimated Budget: \$4,500

Town Run Park Restoration

Town Run South Trail Park is located in northern Washington Township of Marion County and is operated by the Indianapolis Department of Parks and Recreation - Division of Greenways. Town Run South was acquired through the use of a conservation and recreational easement agreement that was to protect the natural, scenic, open space, educational, habitat biodiversity, and recreational values of the property. The easement mandates that Indy Parks must do some specific natural area restoration to increase the ecological function of the protected property.

An 18 acre portion of the property is to be planted in prairie species native to Indiana. Currently, this area is dominated by invasive grasses and a few exotic and native woody species. Debris removal from past mining activities and herbicide application are both required prior to planting with the native prairie mix.

There is a five acre tract of woods that is somewhat degraded but does have some large native trees and pockets of native understory vegetation that are free of exotic vegetation. Restoration efforts in this area will focus on invasive-exotic species control of garlic mustard (*Allaria petiolata*), multiflora rose (*Rosa multiflora*), Amur honeysuckle (*Lonicera maackii*), common privet (*Ligustrum vulgare*), and white mulberry (*Morus alba*).

A 20 acre area of the park that was also mined for sand and gravel that has been reclaimed with cut and fill from mining operations is going through the process of succession and is composed of native and exotic trees. There is a small portion of mature flood tolerant trees, consisting mostly of sycamores, along the banks of the White River that were not removed during mining.

Restoration of this area will consist of removing exotic trees, shrubs, and vines and replacing them with native tree species. Approximately 11 acres of this site will also be planted with a mix of native prairie and open woods understory grasses and forbs per the agreement with Mr. Daugherty and Indy Parks.

The final area in the park is approximately 26 acres and is a portion of gravel pit that has filled with water. This area makes up the southern tip of the park. White River has breached this pit and flows through it. The only task identified in this area is to control the reed canary grass along the edge of the pit.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Invasive plant removal and control.
- Replanting of native trees, prairie grasses and forbs.
- Estimated Budget: \$109,000

Marott Park Restoration

Marott Park is a 102-acre property donated in 1945 by the Marott family to the City of Indianapolis. The park was donated for use as a natural area and 84 acres of the park have been set aside as the Marott Park Woods Nature Preserve. This dedicated state nature preserve is managed by the Indianapolis Parks Department- Office of Land Stewardship with expertise and support from the Indiana Department of Natural Resources (IDNR) Division of Nature Preserves. This tract of land encompasses old second growth forest, an upland ravine system, and successional mesic and floodplain forest.

Because this area lies within a nature preserve, the Indianapolis Parks Department has a responsibility of managing the area in terms of the Nature Preserve Act enacted in 1967 by the Indiana General Assembly. A master plan for the Marott Park Nature Preserve written in 1987 details how the park must be managed as a nature preserve under this act.

The Nature Preserve system is administered by the IDNR-Division of Nature Preserves (IDNR-NP). Their staff provides expertise and support in resource management. In 1995, regional ecologist Tom Swinford for IDNR-NP prepared a document that briefly described the natural features and management issues of the Marott Park Nature Preserve. Specific concerns mentioned include invasive-exotic vegetation, vandalism and other non-authorized uses, erosion and encroachment. Mr. Swinford also made a number of recommendations concerning these issues. Indy Park-Office of Land Stewardship has been working with Mr. Swinford for several years to help solve these problems.

The primary restoration activity in the Marott Park Woods Nature Preserve will focus on controlling several invasive-exotic species of vegetation. These species interrupt forest regeneration, outcompete native vegetation, and provide insufficient resources to native wildlife.

Limited resources have forced Indy Parks to focus on maintaining the less disturbed area of the preserve. Other issues that must be addressed include reforestation, interpretive signing, encroachment by adjacent landowners, vandalism, illegal dumping, and trail development in portions of the preserve where no trail system exists. The preserve has been broken down into seven management areas, Areas A – F.

Area A consists of approximately 16 acres of old second-growth upland-mesic, and wet-mesic forest. A tree, shrub, and herbaceous species list for this area was completed by Butler University between 1999 and 2000 and is included as an appendix. This area has been impacted by human disturbance far less than the rest of the preserve. Restoration activity in this area is limited to the control of a limited number of invasive-exotic species of vegetation including garlic mustard, white mulberry, Amur honeysuckle, wintercreeper, vinca, English ivy, lesser celandine, burning bush, oriental bittersweet, and Japanese honeysuckle. Trail work will continue to need attention to lesson erosion and negative impacts to natural plant communities.

Area B consists of approximately 4 acres of highly disturbed upland forest edge that surrounds Area A. This area consists mostly of invasive-exotic shrubs and vines. Restoration activity in this area will consist of controlling these species and replacing them with native nursery stock. A portion of this area is in a utility easement and will only be planted with short stature native shrub species that will not interfere with

the utility easement.

Area C consists of approximately 20 acres of young wet-mesic and floodplain forest successional field. By looking at the attached aerial photographs from 1941 and 1956 it can be seen that this area was used as farmland. Since then the area was allowed to go into natural succession. Successional species such as staghorn sumac and Canada goldenrod make up portions of the area. Most of the area contains young stands of wet-mesic and floodplain tree species such as sycamore and hackberry. However, almost the entire area contains thick pockets of invasive-exotic shrubs and trees. The most common species is Amur honeysuckle. Other species include Siberian elm, white mulberry, tree-of-heaven, and common privet. There are also several invasive-exotic groundcovers and vines in this area. These include wintercreeper, Japanese honeysuckle, oriental bittersweet, crown vetch, and vinca. Garlic mustard is also present in this area. Restoration activity in Area C includes the control of invasive-exotic vegetation and replacing it with native trees and shrubs. Approximately 3,300 feet of trails will also be upgraded and/or installed.

Area D consists of approximately 5.5 acres of floodplain forest consisting mostly of mature sycamore, ash, boxelder and cottonwood trees. Although the overstory layer contains many large and impressive trees, the understory shrub layer is dominated by Amur honeysuckle and large areas of the forest floor are covered with wintercreeper. Garlic mustard is also present in this area. Restoration activity in Area D will include the control of invasive-exotic vegetation and replacing it with native trees and shrubs.

Area E consists of approximately 24.5 acres of old second-growth mesic, wet-mesic, and floodplain forest. Like Areas A and D, this area has large specimens of native hardwoods. Unfortunately, the understory has been disturbed a great deal by invasive-exotic vegetation. Garlic mustard, lesser celandine and dame's rocket dominate much of the herbaceous layer. Exotic vines, especially wintercreeper, dominate other large portions. This area is also infested with Amur honeysuckle. Restoration activity in Area E will include the control of invasive-exotic vegetation and replacing it with native shrubs and herbaceous species. Approximately 2100 feet of trail will also be upgraded.

Area F is approximately 4.5 acres in size and is very similar to Area E in terms of species makeup and invasive-exotic vegetation infestation. Additional issues in this area include illegal dumping and encroachment. Restoration activity in Area F will include the control of invasive-exotic vegetation and replacing it with native shrubs and herbaceous species. Refuse dumped illegally will also have to be removed. Indy Parks is also considering placing fencing along the park boundary in this area to prevent illegal dumping and encroachment by adjoining landowners.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Removal and control of invasive, exotic vegetation.
- Replanting of native woody and herbaceous vegetation.
- Estimated Budget: \$285,250

Catch and Release Campaign

The Friends of the White River is a non-profit organization that has spear-headed a campaign for catch and release to allow the White River to recover. This campaign consisted of posting signs at boat ramps and public access sites where there is a great deal of traffic for fishing and distribution of brochures. This program encourages anglers to release certain species of fish to allow for the species recovery.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Signs and brochures to promote the campaign to assist the restocking efforts.

- Estimated Budget: \$4,300

River Cleanups

Keep Indianapolis Beautiful, White River Rescue and White River Watchers are all conducting river cleanups on the White River in all three counties. They will use restoration funds to rent dumpsters and other cleanup equipment as needed.

In summary, the following projects identified by the Natural Resource Trustees as meeting the goal and objectives of this restoration plan:

- Rental of dumpsters and other cleanup equipment
- Estimated Budget: \$67,765

Schedule and Budget

This project will be initiated in FFY 2002 (SFY 2001) and will be managed cooperatively by the Natural Resource Trustees. A total of \$6,000,000 (+ interest) is available for restoration implementation. The Natural Resource Trustees will attempt to keep administrative costs associated with implementation of this Restoration Plan and monitoring of restoration sites to minimum required. It is anticipated that most administrative costs will be covered by interest earned on principal in the restoration fund. A summary of the funds allocated thus far is provided below:

\$268,177	Fish Restocking
\$ 80,000	Conservation Easement/Property Acquisition Appraisals
\$ 1,750	Earth Day Indiana Advertisement
\$ 90,300	Fish Community Analysis and Habitat Evaluation
\$233,250	Burr Oak Bend
\$ 58,000	White Owl Restoration
\$238,216	Marian College EcoLab Restoration
\$179,372	Price Property Acquisition & Restoration
\$113,300	Craig Property Acquisition
\$325,681	Indian Creek Properties
\$ 85,500	USGS Survey of Bank Erosion & Large Woody Debris
\$ 15,000	Watershed GIS Feasibility Study
\$ 38,000	Clare Dam Canoe Portage
\$ 4,500	Joyce Avenue Restoration
\$109,000	Town Run Park Restoration
\$285,250	Marott Park Restoration
\$ 4,300	Catch & Release Program
\$ 67,765	River Cleanups
\$2,197,361	TOTAL

The trustees will continue to develop restoration projects until settlement funds have been utilized.

Final Report

At the completion of the project, a final report documenting the implementation of this restoration plan will be prepared. Photos, digital maps with appropriate location and metadata, field plans for restoration activities, and key documents such as agreements, deeds, easements, etc. will be included in the report.

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NATURAL RESOURCE DAMAGE ASSESSMENT SETTLEMENT
RESTORATION PLAN

Co-Trustee concurrence on the Final Restoration Plan for:
White River
Madison, Hamilton, and Marion Counties, Indiana

Scott E. Pruitt
U.S. Fish and Wildlife Service
Date: _____

John M. Davis
Indiana Department of Natural Resources
Date: _____

Elizabeth Admire
Indiana Department of Environmental Management
Date: _____